



OSWER Innovations Pilot

Using Composts to Reduce Lead and Arsenic Soil Contamination

The Office of Solid Waste and Emergency Response (OSWER) initiated a series of innovative pilots to test new ideas and strategies for environmental and public health protection. A small amount of money is set aside to fund creative approaches to waste minimization, energy recovery, recycling, land revitalization, and homeland security that may be replicated across various sectors, industries, communities, and regions. We hope these pilots will pave the way for programmatic and policy recommendations by demonstrating the environmental and economic benefits of creative, innovative approaches to the difficult environmental challenges we face today.

BACKGROUND

In many places across the county, agricultural production has shifted significantly in the last few years and portions of former agricultural sites are currently being used (or are under development pressure) for school and residential construction. The primary individuals at risk as a result of lead-arsenic contaminated soils are children. Former agricultural soils that are used for schools, day care, or residences are primary targets for remedial actions. Also, restraints to economic development due to soil contamination is a significant concern for local communities.

The standard remedial practice for lead-arsenic contaminated soils is removal and replacement of surface soil. This is prohibitively expensive and would result in many sites going untreated. Effective, long-term solutions to area-wide soil contamination will require looking beyond traditional cleanup processes and government agency boundaries.

PILOT APPROACH

The University of Washington in partnership with U.S. EPA Region 10, the Washington Department of Ecology, the Wenatchee School District, the Chelan-Douglas Health District, and the Washington Department of Community, Trade, and Economic Development will build on the results of earlier studies to evaluate compost mixtures, which may contain municipal biosolids, an alternative treatment to lead-arsenic contaminated soils. Previous studies have

indicated that the inorganic fraction of biosolids composts can reduce the bioavailability of metals in contaminated soils.

The pilot will establish a compost facility on property owned by the Wenatchee School District. Different compost mixtures would be produced at the facility and tested in field trials on local contaminated soils. Changes in lead and arsenic availability will be evaluated for the different compost mixtures. In addition to monitoring the efficacy of the different composts for reducing lead-arsenic availability, the cost associated with production of each material will be monitored. If the initial trial shows that some or all of the composts are successful in reducing lead and arsenic availability, the facility will continue to be used as a demonstration facility in cooperation with the Chelan-Douglas Health District, the Wenatchee School District, and State of Washington agencies.

INNOVATION

There is the potential to use a compost amendment as an innovative, less costly alternative treatment for area-wide lead-arsenic contaminated soils. If effective, composting will reduce the bioavailability of lead and arsenic in soils by binding with the inorganic contents of the compost. Compost amended soils are generally more fertile than non-amended soils and can support a plant cover that requires less maintenance. This reduces the potential for wind blown dust as well as the likelihood of exposure of children to bare soil.

BENEFITS

The use of compost to reduce the bioavailability of soil lead and arsenic would provide a cost-effective remedial option that can be used locally over time to reduce the threat of these historical contaminants. It will also reduce risks (real and perceived) associated with the presence of these contaminants in residential and orchard soils that may hinder economic development.

Establishing a pilot composting facility will provide the Wenatchee School District with information on how to develop a permanent facility at which all the organic residuals generated by District schools can be recycled rather than landfilled as is currently done. Successful reduction of lead-arsenic bioavailability will help to generate market forces that promote the recycling of organic residuals.

CONTACTS

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For additional information, visit the EPA OSWER Innovations web site at: www.epa.gov/oswer/iwg.